

Claims:

What is claimed:

1. A variable constant volume cooling/heating unit
5 comprising:
 - a) a two position three way valve, a warm water runout pipe for supplying warm water, a cold water runout pipe for supplying cold water, the warm water runout pipe and cold water runout pipe connected to the two position
10 three way valve,
 - b) a modulating three way valve,
 - c) a supply pipe connected to the two position three way valve and modulating three way valve, and wherein the modulating three way valve is located
15 downstream from the supply pipe,
 - d) a pump located downstream from the modulating three way valve,
 - e) a water coil having a coil outlet and located downstream from the pump, the pump for pumping water
20 through the water coil,
 - f) a return water main and a return water runout pipe, the return water runout pipe connecting between the coil outlet and the return water main, the return water runout pipe connected to the coil outlet for receiving
25 the flow of return water and connected to the return water main, and
 - g) a connecting pipe connected to the modulating three way valve and return water runout pipe and for allowing return water to flow to the modulating three way valve and wherein the modulating three way valve is for
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allowing all, a portion of, or none of the return water to flow there through.

2. The variable constant volume cooling/heating unit
5 according to claim 1 further comprising a thermostat in an electronic controlling relationship with the two position three way valve, the modulating three way valve, and the pump, the thermostat for controlling the two position three way valve, the modulating three way valve, 10 and the pump.

3. The variable constant volume cooling/heating unit according to claim 1 wherein for maximum cooling, the two position three way valve is opened to allow flow from the 15 cool water main, and the modulating three way valve is opened to allow flow of cool water to the water coil, and the modulating three way valve is closed with respect to the flow of return water exiting the water coil to prevent recirculation of the cool water through the water 20 coil.

4. The variable constant volume cooling/heating unit according to claim 1 wherein for maximum heating the two position three way valve is opened to allow flow from the 25 warm water main and the modulating three way valve is opened to allow flow to the water coil, and the modulating three way valve is closed with respect to the water exiting the water coil to prevent recirculation of the warm water through the water coil.

5. The variable constant volume cooling/heating unit according to claim 1 wherein the ventilation air inlet further comprises a damper in electronic communication with and under the control of the thermostat and for 5 controlling the rate of flow of incoming outside air.

6. The variable constant volume cooling/heating unit according to claim 1 further comprising a fan supported therein, the fan for drawing zone return air over the 10 water coil to warm or cool the zone return air and further comprising and exhaust outlet for allowing the return air to be exhausted.

7. The variable constant volume cooling/heating unit 15 according to claim 2 further comprising wherein the thermostat is in a controlling type relationship with the fan to control to rate of air circulation.

8. A variable constant volume cooling/heating unit 20 comprising:

a) a two position three way valve, a warm water runout pipe and a cool water runout pipe, the warm water runout pipe and the cool water runout pipe connected to the two position three way valve, the warm water runout 25 pipe for supplying warm water and the cool water runout pipe for supplying cool water, and a return main and a return water runout pipe for returning water to the return main,

b) a modulating three way valve and a supply pipe 30 connected between the two position three way valve and the modulating three way valve,

- c) a connecting pipe connecting the modulating three way valve and the return water runout pipe,
- d) a coil connecting between the three way modulating valve and the return water runout pipe,
- 5 e) a pump located downstream of the modulating three way valve, and
- f) a thermostat in electronic communication with the two position three way valve and modulating three way valve, and the pump, the thermostat for controlling the
- 10 two position three way valve, the modulating three way valve, and the pump so that none, a portion of, or all of the return water exiting the water coil is recirculated through the modulating three way valve and the water coil.

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9. The variable constant volume cooling/heating unit according to claim 8 wherein in a full recirculation mode the modulating three way valve closes to cut off incoming water flow from the two position three way valve, and the

20 pump recirculates the water through the water coil.

10. The variable constant volume cooling/heating unit according to claim 8 wherein for no recirculation, the modulating three way valve opens to allow the flow of

25 incoming water and at the same time closes to prevent flow in the recirculation loop.

11. The variable constant volume cooling/heating unit according to claim 8 further comprising a ventilation air

30 inlet, the ventilation air inlet has a damper in electronic communication with and under the control of

the thermostat and the damper for controlling the rate of flow of incoming outside air.

12. The variable constant volume cooling/heating unit
5 according to claim 8 further comprising a fan for moving return air over the coil.

13. A method of heating and cooling with a variable constant volume cooling/heating unit comprising the acts
10 of:

a) providing a two position three way valve a warm water pipe and a cool water pipe and connecting the warm water pipe and the cool water pipe to the two position three way valve, the warm water pipe for supplying warm
15 water and the cool water pipe for supplying cool water, and providing a return water runout pipe connected to a return water main for returning return water,

b) positioning a modulating three down stream from the two position three way valve,

20 c) positioning a thermostat in electronic communication with the two position three way valve and modulating three way valve and pump, the thermostat for controlling the two position three way valve and the modulating three way valve,

25 d) providing a pump downstream from the modulating three way valve and providing an electronic connection between the pump and thermostat,

30 e) providing a coil, the pump for pumping fluid through the coil and providing a fan for moving air across the coil, the moving air for being warmed or cooled by the coil, and

f) using the thermostat and controlling the modulating three way valve to control the amount of fluid which is recirculated by the pump through the coil before returning to the return water main.

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14. The method of providing a variable constant volume cooling/heating unit according to claim 13 comprising the further acts of:

a) providing maximum cooling by opening the two
10 position three way valve to allow flow from the cool water main, and opening the modulating three way valve to allow flow to the water coil, and closing the modulating three way valve with respect to the flow of return water.

15 15. The method of providing a variable constant volume cooling/heating unit according to claim 13 comprising the further acts of:

a) providing maximum heating by opening the two position three way valve and allowing flow from the warm
20 water main, and opening the modulating three way valve allowing flow to the water coil, and the keeping the modulating three way valve closed with respect to the flow of warm water so return water does not recirculate through the water coil.

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